Mathematics

PROOF OF A SPECIAL CASE OF THE YELTON-GAINES CONJECTURE ON ISOMORPHIC DESSINS

Claudia Raithel[1], R. Perlis*[2], Univeristy of Michigan- Ann Arbor[1], Department of Mathematics, Ann Arbor, MI 48109, Louisiana State University[2], Department of Mathematics, Baton Rouge, LA 70803, perlis@math.lsu.edu

Let (ρ_0, ρ_1) and (ρ_0', ρ_1') be two ordered pairs of permutations in S_n and let t be a divisor of n. The Yelton-Gaines conjecture states that if at least one of these four permutations is a product of n/t disjoint t-cycles, and if there is a *strong* isomorphism (definition below) $\phi : \langle \rho_0, \rho_1 \rangle \to \langle \rho_0', \rho_1' \rangle$ between the two subgroups of S_n generated by the elements in each ordered pair, then there is a fixed permutation τ in S_n that simultaneously conjugates ρ_i to ρ_i' for $i = 0, 1$. The conclusion of this conjecture can be restated to say that the two *dessins d'enfants* corresponding to the two ordered pairs are isomorphic.

A proof of this conjecture is given in the case in which all of the initial four permutations are fixed-point-free involutions.